U. S. DEPARTMENT OF AGRICULTURE.

REPORT

OF

THE BOTANIST

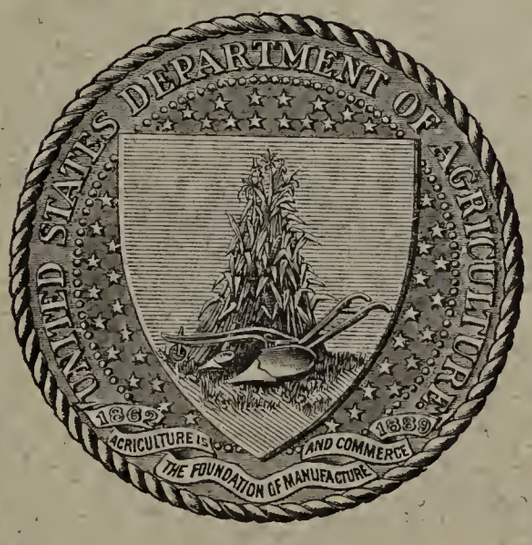
FOR

1898.

BY

FREDERICK V. COVILLE.

[From the Report of the Secretary of Agriculture.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1898.

U. S. DEPARTMENT OF AGRICULTURE.

REPORT

OF

THE BOTANIST

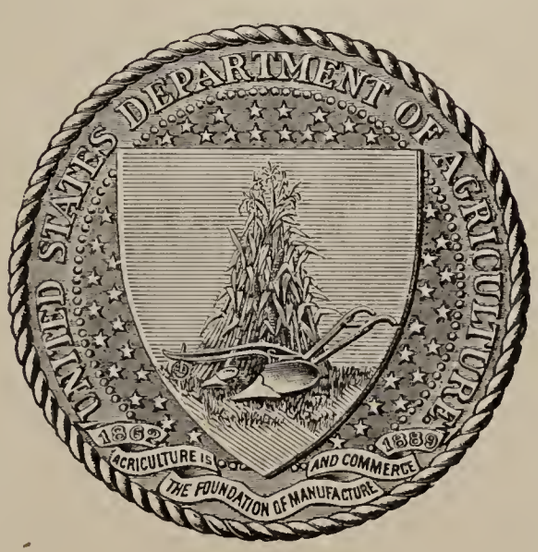
FOR

1898.

BY

FREDERICK V. COVILLE.

[From the Report of the Secretary of Agriculture.]



WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1898.

CONTENTS.

REPORT OF THE BOTANIST.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF BOTANY,
Washington, D. C., October 5, 1898.

SIR: I have the honor to submit herewith my sixth annual report as Botanist of the Department of Agriculture, covering the year ending June 30, 1898.

Respectfully,

FREDERICK V. COVILLE,
Botanist.

Hon. JAMES WILSON, *Secretary.*

WORK OF THE YEAR.

PLANT RESOURCES.

In the annual report of the Botanist for 1895, and again in the report for 1897, was urged the desirability of studying the correlation of different types of natural vegetation with the different kinds of agricultural soils, in order to judge the extent of a particular soil by the vegetation it bears. During the latter part of the fiscal year investigations in this line were inaugurated, Mr. T. H. Kearney, jr., having been transferred for this purpose from the Division of Agrostology.

Preliminary circulars have been sent out requesting information on the distribution of five common and well-known shrubs and trees native to the South and West, and on the crops adapted to the soils upon which these trees and shrubs naturally grow. Field work has been begun in eastern Virginia and adjacent parts of North Carolina, with special reference to the vegetation of the soils upon which truck crops and corn are grown.

During the summer of 1897 an assistant botanist was sent to the Round Valley Indian Reservation, California, to ascertain the uses of native plants among the obscure and little-civilized Indians of that reservation. Great as is our desire to place on record all information obtainable on this subject, only one member of the division force could be spared for this important work during the past year.

The work of Mr. John B. Leiberg, formerly a field agent of the division, on the plant resources of the Columbia Plains, was interrupted at the beginning of the fiscal year by his transfer to the Geological Survey. That department of the Government, having been intrusted with a topographical and statistical survey of the forest reserves, was in need of men trained in timber examination, and this transfer was made in pursuance of a general policy to render all possible assistance to other branches of the public service.

In connection with the botanical exploration work of the Division of Botany in the summer of 1897 the Botanist undertook a special examination of the effect of sheep grazing on the forests of the Cascade Mountains of Oregon. Since the establishment of the Cascade Forest Reserve, in 1893, a keen and sometimes bitter controversy has been carried on by the people of Oregon over the question of sheep grazing within the reserve. Legislation by Congress having made it necessary to devise a series of regulations regarding this industry, and the information in the possession of the Interior Department consisting of a mass of exceedingly conflicting testimony, the need of a disinterested investigation of the facts was felt, and the aid of the Department of Agriculture was solicited. The result of this investigation was published as Bulletin No. 15, Division of Forestry, entitled "Forest growth and sheep grazing in the Cascade Mountains of Oregon."

NEW OR LITTLE-KNOWN CROPS.

Chicory.—In the year 1896 the United States imported 16,317,888 pounds of chicory, chiefly grown in Belgium, having a wholesale value of $226,077. In the belief that this crop could be grown profitably in the United States and the farmers of this country enriched by the amount cited, an investigation was begun, the results of which have been published as Bulletin No. 19 of the Division of Botany, entitled "Chicory growing as an addition to the resources of the American farmer."

Ginseng.—In the year 1895 the division published a bulletin showing that the export of wild American ginseng, which in 1893 was valued at $792,928, was constantly decreasing in amount, while the price per pound was constantly advancing; that the commercial extermination of the wild plant was threatened; and that there was good promise of success for those who would undertake its cultivation. A continued demand for information on the subject led to the preparation of a revised edition of this bulletin, in which it is shown that the commercial status of American ginseng is still firmer than in 1895; that meanwhile the root has been cultivated and marketed successfully on a small scale, and that by the exercise of industry, intelligence, and patience cultivated ginseng may be made a profitable crop.

Horse-radish.—The consumption of horse-radish as a condiment has increased largely in the past few years, and the growing of the plant itself, instead of being confined to the garden of the consumer, has recently come into the hands of market gardeners. A popular desire to know more specifically how to produce a good quality of the root led to the preparation of a short paper on the subject, published as Circular No. 15.

Castor bean, etc.—An investigation of the culture of the castor bean has been completed, with the exception of certain chemical work, and studies of melons recently imported from Russia, and of the growing of bulbs have been begun.

POISONOUS PLANTS.

Owing to the entire lack of laboratory facilities the investigation of poisonous and medicinal plants has been largely conducted through the medium of correspondence and compilation. The division is constantly receiving requests for information concerning the identity of poisonous plants and antidotes therefor. These requests arise chiefly

from the frequent cases of serious and sometimes fatal illness resulting to children and others from eating various portions of deleterious plants. To supply this demand an illustrated Yearbook article by Mr. V. K. Chesnut, entitled "Some common poisonous plants," and an illustrated circular by the chief of the division, entitled "Observations on recent cases of mushroom poisoning in the District of Columbia," have been issued. An illustrated paper by Mr. Chesnut, entitled "Principal poisonous plants of the United States," was in press at the end of the fiscal year, and has since been issued.

In cooperation with the Pan-American Medical Congress, printed blanks have been sent out asking for detailed information regarding the abundance, distribution, and medicinal uses of native plants preliminary to a comprehensive report by that body on the medicinal plants of the United States.

PURE-SEED INVESTIGATIONS.

Our pure-seed investigations have been carried on along two lines: (1) The practical testing of the purity and vitality of commercial seeds, and (2) the investigation of difficult problems in connection with the selection, improvement, and germination of such seeds. One hundred sets, containing 500 specimens each of seeds of grasses, weeds, clovers, and other forage and economic plants, have been prepared for distribution to agricultural colleges and experiment stations, and to foreign seed control stations, in exchange for information furnished to the division. These specimens are neatly labeled and put up in substantial trays of heavy cardboard. Repeated requests have been made by seedsmen, experiment-station workers, and others for authentic specimens of this kind. As a working collection it is believed that this set of economic seeds will prove of unusual value to its recipients.

General seed tests.—The testing of Government seeds during the past year has required less effort than before, owing chiefly to the fact that the seeds were purchased from one firm. Only 1,830 laboratory and greenhouse tests have been required, as against 5,288 tests for the preceding year. In addition to these tests, for the first time in the history of the Department all the varieties of Congressional seed distributed by the Department have been tested in the open field. This work was efficiently done at Kensington, Md., on the trial grounds of the division, by Mr. W. W. Tracy, jr. The fact that some twenty varieties of common garden vegetables proved to be entirely untrue to name, shows the importance, independent of other considerations, of making these field tests. Experiments have also been conducted on the trial grounds concerning the relative value of large and heavy seeds for planting. These experiments are a continuation of those previously made in the division greenhouse, and confirm the results already obtained, namely, that in the end it will pay the farmer well to carefully select large seed as far as possible for planting and throw away the smaller grains. A report embodying the results of these field experiments is now in preparation. The trial grounds were enlarged this year, so that they now embrace $2\frac{1}{2}$ acres. The cost of maintenance, outside the salary of one assistant, has thus far been trivial.

Testing seeds imported by the Department.—Owing to the great danger of importing serious weed pests in the seed which is being received from Russia and other foreign countries, the seed laboratory has undertaken to test all of the samples which pass through the Section of Seed

and Plant Introduction. The importance of this work is evidenced by the fact, for example, that out of a large number of samples of Turkestan alfalfa examined, scarcely one was free from a foreign species of dodder. When this fact was ascertained it was at once reported upon, so that the bulk lots might be thoroughly cleaned. I would strongly recommend that instructions be issued to the different divisions of the Department distributing seeds in any way, whether collected in America or abroad, to submit fair samples of such seed to the Division of Botany for test before any of it is sent out. In this way the possibility of unwittingly introducing serious pests into portions of the country where they are not known would be effectually prevented.

Seed collection.—Over 4,000 specimens were added to the seed collection during the year, making a total number at present of about 20,000.

Vitality of old seeds.—Tests are now being conducted in the seed laboratory to ascertain the average duration of vitality of vegetable and grass seeds.

WEEDS.

The work on weeds has consisted largely in correspondence, the determination of plants which have appeared as new weeds in various localities, and the furnishing of information as to their character and the best method for their eradication. Data have also been collected in regard to the range, distribution, and method of control of weeds. A "Report on dodders infesting clovers and alfalfa" was published as Circular No. 14. An investigation has also been undertaken in regard to the burs injurious to wool and in regard to the plants which impart a disagreeable taste to dairy products.

PERFUMERY PLANTS.

Nearly all the perfumery used in this country is imported, partly as finished product, and more largely as raw material. Many standard perfume plants can probably be grown with success in this country, while many native plants give promise of yielding attractive perfumes. An investigation of the feasibility of producing the raw materials of perfumery in the United States has been undertaken, and some of the facts learned will be set forth in an article prepared for publication in the Yearbook of the Department for 1898.

CORRESPONDENCE.

About 5,000 letters have been written during the year. These have been chiefly replies to inquiries about plants. Whenever possible, such inquiries are answered by circulars and other publications. A large number of plants, mostly weeds, and supposed useful or injurious plants, together with seeds, have been received for identification.

EXHIBIT AT THE TRANS-MISSISSIPPI EXPOSITION.

An exhibit, illustrating the principal poisonous plants in the United States, the most important commercial seeds and their common impurities, seed-cleaning machinery, and the apparatus and methods used in testing seeds in the seed laboratory, was prepared for the Government exhibit at the Omaha Exposition and duly installed.

PUBLICATIONS.

The following publications, prepared in the Division of Botany, were issued during the year:

Bulletins.—No. 19, Chicory Growing as an Addition to the Resources of the American Farmer, by Maurice G. Kains, issued May 21, 1898; Farmers' Bulletin No. 28, Weeds, and How to Kill Them (reprint), by Lyster H. Dewey, issued May 12, 1898.

Contributions from the U. S. National Herbarium, Vol. V, No. 3.—Studies of Mexican and Central American Plants, by J. N. Rose, issued August 27, 1897.

Circulars.—No. 12, The Camphor Tree, by Lyster H. Dewey, issued August 25, 1897 (revised edition issued September 29, 1897); No. 13, Observations on Recent Cases of Mushroom Poisoning in the District of Columbia, by Frederick V. Coville, issued December 11, 1897 (revised edition issued February 15, 1898); No. 14, Dodders Infesting Clover and Alfalfa, by Lyster H. Dewey, issued May 2, 1898; No. 15, Horse-Radish, by Maurice G. Kains, issued June 10, 1898.

Report.—Report of Botanist for 1897, by Frederick V. Coville, issued May 14, 1898.

Papers prepared for the Department Yearbooks for 1896 and 1897.—Some Common Poisonous Plants, by V. K. Chesnut, Seed Production and Seed Saving, by A. J. Pieters, and The Superior Value of Large Heavy Seed, by Gilbert H. Hicks and John C. Dabney, issued July 19, 1897; Migration of Weeds, by Lyster H. Dewey, issued July 21, 1897; Division of Botany, by Frederick V. Coville, issued May 24, 1898; Additional Notes on Seed Testing, by Gilbert H. Hicks and Sothoron Key, issued May 24, 1898.

IMPROVEMENTS AND PLANS FOR THE FISCAL YEAR 1899.

The work of the Division of Botany has been considerably hampered during the past and preceding years by its cramped and inconvenient quarters, but the agricultural appropriation act for the fiscal year 1899 carries an item for the rent and alteration of a more commodious building, which will be occupied as a botanical laboratory.

GREENHOUSE.

The greenhouse facilities available for our use having become inadequate for our increasing experimental work, authority was asked of Congress, and secured, to erect a suitable plant house for this purpose. This house, which will greatly facilitate our investigations, should be ready for occupancy before the end of the year.

SEED-TEST LAW.

The act of Congress making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1899, under the heading "Botanical investigations and experiments, Division of Botany," contains the following clause:

> The Secretary of Agriculture is hereby authorized to purchase samples of seeds in open market, test same, and when found not up to standard he may, at his discretion, publish the results of these tests, together with the names of the seedsmen by whom the seeds were sold.

Under date of May 10, 1898, a circular, signed by the Secretary of Agriculture, was sent out to seedsmen, announcing the conditions under which these tests would be made, and stating that it would be the aim of the Department of Agriculture in carrying out this law to put a stop to the sale of seed so poor as to make probable a positive injury and loss to the purchaser, thus giving protection on the one hand to the farmer and gardener and on the other hand to the honorable seedsman and seed dealer.

AMERICAN SEED GROWING.

At the present time a large amount of the vegetable and grass seed used in America is imported. The new and destructive weeds which appear in this country from year to year are principally introduced through the medium of this imported seed. To minimize this danger, and also to aid in building up what has already proved a great industry in some sections of the country, the Division of Botany proposes this year to inaugurate a series of field investigations on the growing of those varieties of flower, vegetable, and grass seeds which are now wholly or chiefly secured from abroad.

FUTURE PLANS.

PARIS EXPOSITION.

An exhibit of some of the principal plants and plant products of this country should be prepared by the Division of Botany during the coming year for the exposition at Paris in 1900. It would be superfluous to lay special emphasis on the fact that any exhibit sent to Paris as illustrative of so important a branch of our national industries should be worthy of its subject. It is almost needless, too, to point out that the regular force of the Division of Botany can not do more than give a plan and direction to such work without seriously interfering with investigations now in progress. Provision should be made, outside our current appropriations, for the employment of the labor necessary in the preparation of such an exhibit.

PLANT RESOURCES OF HAWAII AND OTHER TROPICAL POSSESSIONS.

Already inquiries have reached the division concerning the plant resources of Hawaii, Puerto Rico, the Philippines, and Cuba. A thorough botanical survey of the economic plants of such of these countries as may come into the possession of the United States should be undertaken as soon as practicable. A report upon the economic plants, both cultivated and native, of each country we shall acquire would be eagerly welcomed by the American people and would be widely useful.